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Procedia Social and Behavioral Sciences 2 (2010) 3422–3426

Procedia
Social and Behavioral Sciences

WCES-2010

Considerations about medical research in Romanian universities

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Received October 28, 2009; revised December 4, 2009; accepted January 14, 2010

Abstract

The study aims to present a series of results related to the medical research in Romania, taking into account the data obtained by the application of a statistical survey to the medical staff with higher education in Bucharest. Based on the data series resulting from the application of this questionnaire we obtained information related to the medical staff opinion on issues regarding the following: the organization of research at the universities, the quality of the documentation sources available to medical personnel that work in the medical research, the quality of the national and international academic, the endowment of medical research laboratories with equipment to enable support of the medical research, the quality of the databases that support the development of quantitative medical studies.

Keywords: Medical research;statistical survey; quantitative medical studies;healthcare system reform;aggregate variables.

1. Introduction

We can find elements about the importance and priorities of the medical scientific research, more or less explicitly, in all scientific documents prepared by the National and European authorities. One of the relevant documents is Order no. 215/29 from March 2002 issued by the Ministry of Health that define the areas of medical research: clinical scientific research that is medical research associated with providing medical services, medical research in public health, similar in status to the clinical scientific research, refers to the identification of the risk factors correlated with different pathological processes, the incidence and prevalence of transmissible and non-transmissible diseases and their complications, fundamental medical research regarding the areas of molecular biology, genetics, histology, immunohistochemistry, immunology, pharmacokinetic, identification of the different pathogenic mechanisms, improving the diagnostic and therapeutic procedures in various morbid entities. The study is based on series of data obtained through the application of a statistical survey to a sample of physicians from the Bucharest university center. The sample was composed by 452 people, the error is 2%, and the results are guaranteed with a probability of 98%.

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doi:10.1016/j.sbspro.2010.03.527

There is a worldwide concern for the analysis of trends on the usage of funds for medical research (McCarthy, 2007) or the assessment of various components of medical research in developed countries (Nicholl, 2006).

In the paper we will not assess the level of expenditure for medical research in Romania or the trends of specialization in certain areas but we will try to assess the position of health professionals regarding specific aspects of medical research at the level of a country in transition.

2. Level one aggregate variables definition

2.1. Medical research system capacity

Research is an important component of a medical university. Therefore, the development of this component for any university provides a high prestige in the academic world and a source of funding. University research is a complex field whose performance is determined by many factors such as system organization, scientific prestige of professors, documentation sources, national and international collaborations.

In order to analyze the potential of the medical research the following factors were taken into account in this study: the organization of the research activity in the university (A1_1), the documentation sources available to the medical personnel (A1_2), national academic collaborations (A1_3), international academic collaborations (A1_4), the research laboratory facilities that support the medical research (A1_5), Internet access (A1_6), the existence of some well-defined research directions (A1_7), the existence of updated statistical databases (A1_8). We used a scale with five values to measure the quality of each element that supports scientific research: from 1 when the contribution of the corresponding factor is very bad, to 5 for a situation when the factor has a very good contribution.

For the overall assessment of the medical research capacity we define CCM - the level one aggregate variable based on the application below:

$$CCM : P \to [1, 5], \qquad where \qquad CCM_i = E(A_i1\_1,..., A_i1\_8). \qquad [1]$$

A high value for this variable emphasizes a favorable contribution of the eight factors to the development of the medical research.

2.2. The reform process and the scientific research

The process of integration into the European Union recommends a number of changes in the research activity so that in an average time perspective the research results to be comparable with those of the rest of the world. Hence, a new approach in organizing the research and its funding is recommended. In our questionnaire we included four questions about an important issue - the extent to which the current reform process in the public health system support the research capacity development in the medical units in terms of: work organization, human resource development, material base development, and research funding capacity development.

We appealed to a scale with four values to measure the medical staff opinion on these issues: from 1 if the person perception is that the current reform process slightly supports the increasing of the research capacity, to 4 if the support is very high. Based on the four questions we defined the primary variables A2_1, A2_2, A2_3 and A2_4. For an overall assessment on the perception of the reform process in public health to support the development of the research capacity of the medical institutions in Romania we defined the RCM variable based on the application below:

$$RCM : P \to [1, 4] \qquad where \qquad RCM_i = E(A_i2\_1,..., A_i2\_4). \qquad [2]$$

If the variable value is small, then, in the opinion of the medical staff, the health system reform process hasn't contributed positively to support the scientific research in medical universities.

3. Data series analysis

3.1. Medical research system capacity

After calculations, we obtained the average and variance indicators in Table 1 for the primary variables defined to characterize the medical research system.

Table 1. Average indicators of the variables characterizing the research system capacity

1	2	3	4	5	6	7	8
2,45	2,55	2,44	2,10	2,39	2,91	2,35	2,18
(1,179)	(1,234)	(1,096)	(1,157)	(1,186)	(1,373)	(1,215)	(1,165)

Based on the relationship [1] we calculated the data series that will be used to characterize the current system of the medical research as a whole. After processing the data series we obtained the following results:

1. The indicators used to characterize the degree of variation of the data series, the asymmetry and the flattening have the following values: 0.978 for the standard deviation, 0.575 for skewness, and -0.086 for Kurtosis. These values highlight an asymmetric distribution of the responses. It shows that a large share of the medical staff consider that the eight factors have all unfavorable contribution to support of the research.
2. Using ANOVA we get that there aren't significant differences in the opinion on the research capacity of the medical universities in our country by groups of persons defined in relation to individual sex, age and category of the staff. The differences are in the groups of persons defined by the academic degree. The value of the F statistics is equal to 2.87 (the level of significance is 0.03). The average values of this variable on university degrees are presented in figure 1. We can find a relatively favorable perception of the research capacity at the professors' level, while the opinion is the worst among assistants and lecturers. The most favorable opinion is among professors and is related to the quality of documentation sources, the average value of the primary variable being 3.23. The worst opinion is among assistants and refers to laboratories endowment with medical equipment, the average value of the variable being 1.23.

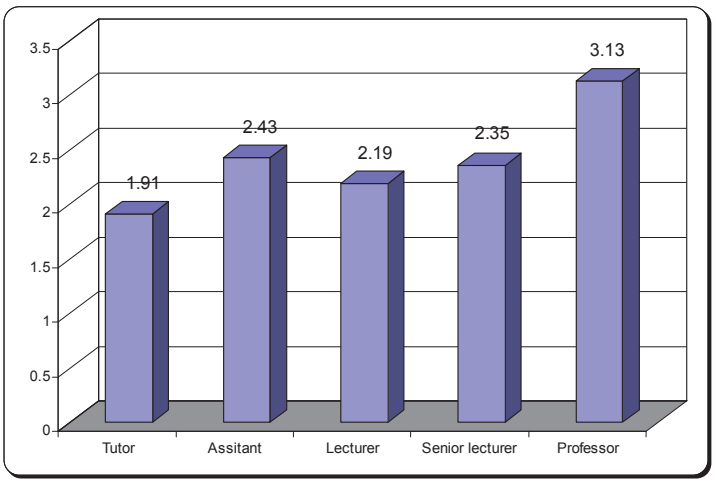

Figure 1. Perception about the research capacity on university degrees

3.2. The reform process and the scientific research

The distributions of the responses to questions about the feature of the reform process to support the scientific research are presented in Table 2. We computed the average indicators for the four primary variables to have a synthetic assessment of the opinion of physicians who conducted research activities on the characteristics of the health system reform process to support the medical research. The results are presented in Table 3. The standard deviation is listed in parentheses, below each value.

Table 2. The feature of the reform process to support the scientific research (%)

	1	**2**	**3**	**4**	**Total**
The organization of the research activity	47,3	38,7	11,3	2,7	100,0
Human resources development	40,7	48,0	7,3	4,0	100,0
Material base development	38,0	39,3	17,3	5,3	100,0
Funding capacity of the research activity development	48,0	28,7	16,7	6,7	100,0

Table 3. The average values of the primary characteristics used to characterize the reform process

The organization of the research activity	**Human resources development**	**Material base development**	**Funding capacity of the research activity development**
1,69	1,75	1,90	1,82
(0,777)	(0,761)	(0,873)	(0,942)

Using the relation [2] we define the data series for the RCM variable. After processing the data series we obtained the results presented below:

1. The histogram of the data series is presented in figure 2. The graph reveals a predominance of three types of opinions that correspond to the values of the variable equal to 1, 1.5 and 2, so to the less favorable opinions;

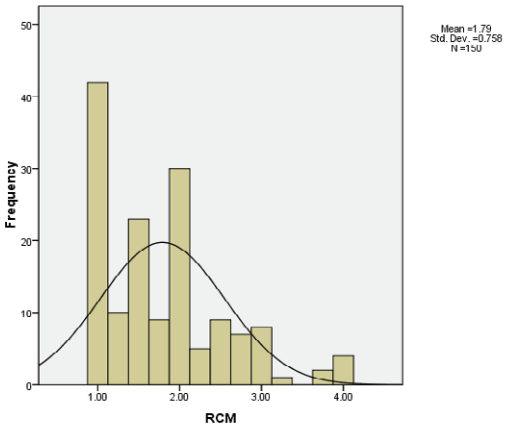

Figure 2. Histogram of the RCM variable

2. The average of the variable is equal to 1.79, which significantly differs from 2 (t-Student statistics value is equal to -3.40, and the level of significance is $\alpha = 0{,}00$) that shows a very unfavorable opinion on the ability of the current reform process to bring essential changes in the scientific research in medical institutions in our country. The worst opinion is about improving of the research activity organization by the reform measures initiated in the

current reform process in the public health system. A somewhat favorable opinion regards the development of the material base.

3. Opinions don't differ in the groups organized by sex, age and type of staff. Using ANOVA analysis we obtain that the differences are significant in relation to the academic title of the person. The value of the F statistics is equal to 1.95 and the level of significance is $\alpha = 0{,}07$. The average values for the RCM variable for these groups of physicians are listed in Table 4. Professors and senior lecturers have a relatively favorable opinion on the ability of the health system reform process to support the development of the medical research in medical institutions in the country. At the opposite end are assistants and lecturers who have a very unfavorable opinion on this issue.

Table 4. The average values for the RCM variable on academic titles

Without academic title	Tutor	Assistant	Lecturer	Senior lecturer	Professor
1,78	1,25	1,73	1,45	1,93	2,25
(0,740)	(0,418)	(0,764)	(0,610)	(0,616)	(1,072)

4. Conclusions

There are a number of issues related to maintaining the scientific research at a high level in the medical universities in Romania. These issues are related mainly to the inadequate financing system and the difficulties that arise in a country during transition. The study highlighted several positive aspects related mainly to the human resources involved in this complex process.

The development of the scientific research will be an important factor to increase the prestige of medical universities and to attract new funding in the medical field. Supporting the medical research activity by each university will be a key factor for increasing competitiveness to the European level.

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